

Ser. No. 10/037,845
522.009PA

In the Claims:

Please amend the Claims to read as follows:

1 – 1. (Currently amended) High-resolution sheet metal scanner using machine vision for checking
2 the accuracy of openings drilled or punched into a mechanical part, comprising:

3 a lower assembly which includes a housing ~~which is environmentally sealed sufficiently~~
4 ~~to exclude dust and contaminants~~; a planar scanning camera carriage assembly within said
5 housing and capable of producing controlled movement of a camera carriage member in two
6 orthogonal directions in a horizontal plane; a flat transparent support plate disposed on an upper
7 side of said housing on which said part is to be supported for viewing; and a camera assembly
8 mounted on said carriage member and oriented upwards including an imager for producing at
9 least one line of pixels and focussing means for focussing said imager upon an upper surface of
10 said support plate;

11 a generally linear illuminator mounted above said lower assembly and providing a
12 substantially uniform light along a line in one of said orthogonal directions, and being linearly
13 movable in the other of said orthogonal directions across said support plate;

14 camera carrier control means coupled with said camera carriage assembly and with said
15 camera assembly for guiding said camera assembly in a controlled scanning pattern within said
16 lower assembly housing and processing image data of said part based on pixels produced by said
17 camera assembly imager; and

18 illuminator control means for linearly moving said illuminator in the other of said
19 orthogonal directions to track motion of said camera carriage member;

20 wherein said linear illuminator is mechanically independent of said camera carriage
21 assembly.

1 2. (Original) The high-resolution sheet metal scanner of Claim 1 wherein said camera assembly
2 includes a polarizing filter.

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1 3. (Original) The high-resolution sheet metal scanner of Claim 1 wherein said illuminator
2 includes a single fluorescent tube extending across said support plate.

1 4. (Currently amended) The high-resolution sheet metal scanner of Claim 3 wherein said
2 illuminator is disposed at about one substantially an inch above said support plate.

1 5. (Original) The high-resolution sheet metal scanner of Claim 1 wherein said scanning camera
2 carriage assembly includes a first lead screw, a first stepper motor for controllably rotating said
3 first lead screw, a second lead screw, a second stepper motor for controllably rotating the second
4 lead screw, first and second stage rails arranged orthogonally and means for permitting said
5 camera carriage to travel along said first and second stage rails in accordance with rotation of
6 said first and second lead screws.

1 6. (Original) The high-resolution sheet metal scanner of Claim 5 including first and second high-
2 resolution encoders within said housing for determining X and Y location of said camera
3 carriage.

1 7. (Original) The high-resolution sheet metal scanner of Claim 1 wherein said imager includes a
2 linear imager producing one line of pixels at a time.

1 8. (Original) The high-resolution sheet metal scanner of Claim 1 including position adjusting
2 means for fine adjustment of vertical position of said support plate.

1 9. (Original) The high-resolution sheet metal scanner of Claim 1 wherein said control means
2 includes means to adjust the dimensions of scan to the size of the part.

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1 10. (Original) The high-resolution sheet metal scanner of Claim 1 wherein said lower assembly
2 further includes motion damping support means to minimize effects of floor vibration on action
3 of the scanning carriage assembly.

1 11. (Original) The high-resolution sheet metal scanner of Claim 10, wherein said motion
2 damping means includes means for tuning to damp out specific frequencies.

1 12. (Original) The high-resolution sheet metal scanner of Claim 1, wherein said camera has a
2 body portion with its center of gravity disposed beneath the plane of said scanning camera
3 carriage assembly.

13. (Canceled – incorporated into Claim 1)

1 14. (Original) The high-resolution sheet metal scanner of Claim 1, wherein said camera carrier
2 control means includes means for calibrating over the entire surface of said support plate to
3 compensate for defects in the linear rails and in the support plate.

1 15. (Original) The high-resolution sheet metal scanner of Claim 1, further comprising means for
2 adjusting the focussing means of said camera assembly to focus the camera at any of a plurality
3 of different heights above said support plate.

1 16. (New) The high-resolution sheet metal scanner of Claim 1, wherein said housing is
2 environmentally sealed sufficiently to exclude dust and contaminates.

1 17. (New) The high-resolution sheet metal scanner of Claim 4, wherein the height of the
2 illuminator above said support plate is adjustable. –